PB-230 686

POTOMAC RIVER ENFORCEMENT CONFERENCE WASHINGTON METROPOLITAN AREA

Environmental Protection Agency
Washington, D. C.

20 June 1972

DISTRIBUTED BY:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

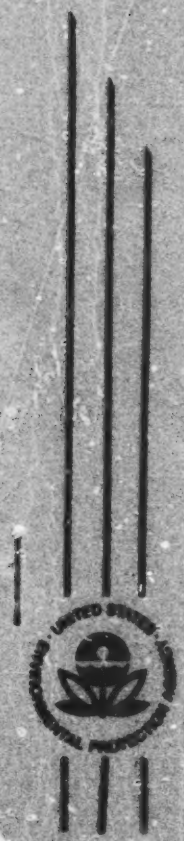
PB 230 686

POTOMAC RIVER
ENFORCEMENT CONFERENCE
WASHINGTON METROPOLITAN AREA

STATUS REPORT

PROGRESS MEETING-June 20,1972

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151



Prepared by

Office of Water Enforcement

Environmental Protection Agency

Washington D.C.

TABLE OF CONTENTS

		Page
	Summary	1
	Introduction	4
I.	The Blue Plains Project - Funding	7
II.	Blue Plains Interim Treatment Program	10
III.	Requirements for and Scheduling of Wastewater Treatment Facilities in the Conference Area (Except Blue Plains)	12
IV.	Evaluation of Wastewater Treatment Plants in the Conference Area (Except Blue Plains)	22
V.	Provision for Additional Facilities and Selection of Sites in the Conference Area	26
VI.	Piscataway-National Park Service Easement	28
VII.	Allocation of Waste Loads to the Several Regional Facilities (To Assure No Overloading of Blue Plains)	29
VIII.	The Need for a Washington Metropolitan Regional Plan	32
IX.	Combined Sewers and Storm Wastes	33

SUMMARY

1. Delays

Blue Plains facility - The delay in completion of the AWT date can roughly be measured from April 1, 1972, until the date that Federal Construction Grant funds become available. The completion date recommended by the conferees is January 1, 1975.

Virginia

Alexandria, Arlington County, and Fairfax County (Lower Potomac Plant) were scheduled, as recommended by the conferees, to be operational July 1, 1973. On April 10, 1972, the Governor of the Commonwealth of Virginia informed the Administrator, EPA that the July 1, 1973, completion date could not be met but that all three facilities would be completed to coincide with the completion date for Blue Plains facility, January 1, 1975.

Maryland

Piscataway facility - This facility including advanced waste treatment units, was to be under construction by July 1, 1971, and the facility was to be operational by January 1973. The primary and secondary units are now under construction.

The delay is in the design and construction of the advanced waste treatment units. The WSSC has reported that advanced waste treatment facilities are under design and that plans and specifications will be submitted to the State for review in the near future. The approved scheduled date, March 1, 1971, for completion of plans and specifications has passed and EPA has not to date (May 23, 1972) been advised of a revised firm date. At the present time there is under construction a primary and secondary facility designed to accommodate 30 mgds. It is recommended that WSSC take immediate action to meet the treatment levels set for its present Piscataway plant; and that it set a firm date for completion of the plans and specifications for its proposed AWT addition.

Montgomery County Regional facility - This facility was scheduled to make site selection March 1971 and to complete construction in June 1977. The latest report, May 1972, indicated that site selection and purchase will be made in November 1972, twenty months later than scheduled.

Studies were made to project populations and the resulting wastewater volumes of flow generated therefrom in areas presently tributary to the Blue Plains facility. The studies show that wastewater loads to the Blue Plains facility overaging 309 mgd will be generated during calendar year 1976. The design capacity of the

Blue Plains facility is for an average flow of 309 mgd. Alternative plans should be developed immediately to relieve the overloads which are anticipated after January 1, 1976. If a large regional plant in western Montgomery County is to be the alternative selected to reduce the wastewater loads to the Blue Plains facility, such a facility should be operational by July 1975.

Federal Installations

Pentagon facility, Arlington County, Virginia. This facility was scheduled to be completed April 1, 1973. The General Services Administration has reached agreement with Arlington County whereby the Pentagon facility will be abandoned and its wastes discharged to the Arlington County treatment facility. The completion schedule for treatment of these wastes is now that of the Arlington County facility, January 1, 1975, or about 21 months later than recommended by the Conferees.

Fort Belvoir, Fairfax County, Virginia facility - The preliminary plan calls for a regional solution that will eliminate the two Fort Belvoir plants and transport wastes to the Lower Potomac Treatment plant. Since this project is not scheduled for completion until the summer of 1974, the elimination of the two Fort Belvoir plants will be approximately one year behind the original operational date proposed by the Conferees.

Naval Ordinance Laboratory, Silver Spring, Maryland facility - The projected completion date is approximately nine months behind the original operational date set by the Conferees but connection of the facility is scheduled to coincide with the completion of secondary facilities at the Blue Plains facility. This is necessary so that the equivalent treatment presently being provided will be assured.

Andrews Air Force Base, Maryland facility - The Air Force proposes to eliminate the three existing secondary wastewater treatment plants and connect to the regional system of WSSC. The negotiation process has caused the project to fall approximately seven months behind schedule. The Air Force personnel believe that the original construction completion date, May 1, 1973, set by the Conferees can be met if Prince Georges County approves a change in the plan.

2. The need for a water quality management Regional Plan is a high priority issue. We recommend that the Conferees assign the development and implementation of a water quality management Regional Plan to an appropriate body having significant responsibilities in this area.

3. As recognized by the Conferees in the third session held April 2, 3, and 4 and May 8, 1969, and as documented in Recommendation number 14 in the summary of conference, consideration of loads to the Potomac River estuary must necessarily include incoming waste loads

from the Upper Basin. We recommend that the Conferees take further action to effect a reduction in the waste load contributed by the Upper Basin.

4. Measurement of flows from areas presently tributary to the Blue Plains facility are essential to assist in the prevention of the overloading of that facility. In addition, such measurements would assist in planning and design of future engineering work in solving problems of infiltration and of combined sewers. We recommend that the Conferees formally require monitoring and measurement of all sewers contributing wastewater loads to the Blue Plains facility. This work could be a cooperative effort of all jurisdictions involved.

5. The control and treatment of wastes related to combined sewers and storm waters may be the next large construction program. The program of construction of wastewater treatment facilities in the Conference Area will be well under construction with completion dates scheduled by June 1977. We recommend that the initiation of planning, design, and construction of engineering works to alleviate pollution problems from combined sewers and storm waters should not be longer deferred.

6. The draft Report of the Oil Survey Committee was completed in December 1970 and was informally presented to the Conferees. This procedure was followed because the issuance of Federal Regulations as required by Section 11 (j)(1) of the Act was expected in the near future.

   It is recommended that the Committee be instructed to complete its report in final form containing its recommendations with the proviso that any promulgated Federal Regulations shall govern.

7. The Corps of Engineers and the National Park Service have been formally invited to describe their programs relating to removing and preventing debris from washing into the Potomac River estuary and relating to keeping the shores of the Potomac River free of debris and litter, as set forth in Recommendations 9 and 11 of the above described Third Session of the Enforcement Conference.

   Following these presentations, the Conferees may wish to develop further recommendations on these matters.

INTRODUCTION

The pollution problem of the Potomac River estuary is a complex one and is generally described in the following explanation. It is related to a large population concentration in the Washington Metropolitan Area discharging domestic wastes to treatment facilities which are presently inadequate in size and removal capacity. The treatment facility is further overburdened by large quantities of dilute wastewaters resulting from storms and entry into the treatment facility by combined sewers. The inadequately treated wastes are discharged to a river which is relatively small, at critical times, having at Great Falls an average discharge of 10,780 cubic feet per second (cfs) with a minimum of 610 cfs and a maximum of over 484,000 cfs. Problems are especially evident and magnified during the low flow and warm weather season. The nutrients, phosphorus and nitrogen, added from the domestic wastes to the shallow tidal estuary contribute to eutrophication of the estuary with resulting secondary demands on the oxygen resources of the estuary. The rate of growth of algae is also related to turbidity, and incoming sediments from the Upper Basin. The adverse effects of these several actions are further complicated by tidal action in that there is an interchange of waters in both directions, i.e. upstream as well as downstream. Such action is significantly different from a free flowing stream.

The current program and efforts to clean up the Potomac River derived initial impetus from the Third Session of the Potomac River Enforcement Conference held on April 2, 3, and 4 and May 8, 1969. Major pollution sources identified at this conference session were the District of Columbia (Blue Plains treatment facility), Virginia waste treatment plants in Arlington, Alexandria, and Fairfax, the Piscataway plant, and Federal installations including the Pentagon, Andrews Air Force Base, Fort Belvoir, and the Naval Ordnance Laboratory. The conference established limits on BOD_5, phosphorus and nitrogen for the Pentagon, Arlington, District of Columbia, Alexandria, and Fairfax Westgate treatment facilities. These requirements were developed on the basis of the pollutional loading that could be handled by the Potomac River estuary without causing deleterious effects.

The conferees also described treatment requirements of 96% BOD_5 removal, 96% phosphorus removal, and 85% total nitrogen removal for other treatment plants in the conference area if they discharge their effluents to tributaries or embayments of the Potomac River. These recommendations were approved by the Secretary of the Interior.

A progress evaluation meeting was held November 6-7, 1969, and the third session of the conference reconvened on May 21-22, 1970, and October 13, 1970.

At the May 21-22, 1970, meeting, the conferees considered alternative programs for pollution abatement to meet the 1969 conference requirements. The conference recessed and the conferees met in work sessions, and a Memorandum of Understanding was developed between Fairfax County, Virginia; the Washington Suburban Sanitary Commission, Maryland; and the District of Columbia Department of Sanitary Engineering. This document involves a commitment to a regional-type treatment facility and a plan for accomplishing the required degree of treatment. The Memorandum of Understanding was accepted by the conferees at their October 23, 1970, session. Secretary Hickel endorsed the plan, but objected to the 1977 completion date for the tertiary facilities, recommending that the date be moved forward to 1974.

The conferees met on December 8-9, 1970, and endorsed a plan by the District of Columbia to accomplish completion of the facilities by the end of 1974. However, any delays in funding by the Federal, State and local jurisdictions will mean that timely accomplishment of this plan cannot be achieved. Progress meetings for the conference were held on April 29, 1971, October 5, 1971, and November 11, 1971.

Comparing the Blue Plains facility and all other facilities in the area readily shows that any event which causes delay in the completion of any part of the Blue Plains facility or which is related to overloading now or in the future must be considered a high priority problem in the Potomac River estuary.

The total population served in the metropolitan area in 1970 was approximately 2,559,150, consisting of 639,000 served by Virginia facilities, 71,850 served by Maryland facilities and 1,848,300 served by the Blue Plains facility which included about 920,000 persons from Maryland. In 1970 the treated waste loads in the area totaled approximately 140,985 pounds per day of BOD_5, 24,022 pounds per day total phosphorus and 55,672 pounds per day of total nitrogen. Of these totals, Virginia facilities contributed 32,525 pounds per day of the BOD_5, 6,150 pounds per day total phosphorus and 8,270 pounds per day nitrogen; Maryland facilities contributed 920 pounds per day BOD_5, 402 pounds per day of the total phosphorus and 742 pounds per day nitrogen; and the Blue Plains facility and overflows from the D. C. system contributed 107,540 pounds per day BOD_5, 17,470 pounds per day total phosphorus and 46,660 pounds per day of the nitrogen. The wastewater flows from the Blue Plains facility amount to over 265 mgd. Flows from all other facilities in the conference area amount to less than 100 mgd.

If the levels of treatment recommended by the Conferees had been in operation in 1970, the waste loads in Zone 1 would have been reduced in the following manner:

The BOD_5 load of 137,260 pounds per day would have been 16,500 pounds per day.
The phosphorus load of 22,765 pounds per day would have been 740 pounds per day.
The total nitrogen load of 53,220 pounds per day would have been 8,000 pounds per day.[1]

In Zone 2 the loadings in 1970 were 3,345 pounds per day BOD_5 whereas if there had been the recommended 96% removal, the loadings to the river would have been 760 pounds per day BOD_5.

A full comparison of 1970 treated waste discharges and conference requirements on a plant by plant basis for each zone is provided in Appendix A.

[1] The allocations to each plant in Zone 1 will be found on page 12 of this report.

I. The Blue Plains Project - Funding

The District of Columbia Water Pollution Control Plant at Blue Plains is a regional treatment facility which serves all of the District, a large portion of Montgomery and Prince Georges Counties in Maryland, and portions of Arlington, Loudoun and Fairfax Counties in Virginia. The present plant treats about 265 mgd, with peak flows of about 300 mgd. The plant presently removes about 70% of organic pollutants.

The Blue Plains facility will be expanded to an average capacity of 309 mgd, and in accordance with the requirements of the Potomac River Enforcement Conference, will also be upgraded to provide a very high level of treatment for organics and nutrients. The design is for organic removal of about 96% and nutrient removal greater than 90%. The project to expand and upgrade the Blue Plains facility is being pursued to meet the 1974 date for completion as requested by the Secretary of the Interior through the Potomac River Enforcement Conference. The District of Columbia, as the owner and operator of this facility, is acting as the construction agent. The overall project, costing an estimated $360 million, will be constructed utilizing a number of different contracts for different portions of the construction work.

Financing[1] has been arranged on the initial project phases as follows:

Project Phase	Grant Offer	Total Estimated Cost
Primary Facilities	$ 8,206,490	$ 19,042,000
Sludge Handling Facilities	15,361,490	27,930,000
Excavation, dredging, dock, and concrete plant	25,794,990	46,900,000
Secondary Facilities - Initial contracts	17,497,583	31,800,000
Total	$66,860,553	$125,672,000

Construction is presently underway on a number of phases of the total project. The primary facilities phase has now been under construction for about a year and foundation work for the sludge handling facilities is underway. Dredging for a barge channel to the plant is nearing

[1]As of May 1, 1972

completion and construction of dock facilities has begun. Mass excavation for the secondary and tertiary facilities was started recently and installation of the mineral addition facilities for the interim treatment program was complete by the May 15 target date. Chemical treatment will begin June 1, 1972, on a reduced scale.[2] Financing of the AWT phase of the project is being held up because of the present lack of Federal funds available to make additional grant offers. This lack of Federal grant funds is causing a delay in the final completion date[3] for the project. Funds from all other involved jurisdictions are available.

The District of Columbia has identified a need for an additional amount of $62 million in Federal funds to finance FY-1972 phases of the project. These funds were required by April 1, 1972, if the project was to stay on schedule and delays in the final project completion date can roughly be measured from April 1 until the date that funds are available.

On May 4, 1972, the Senate passed S. 3572 to amend Sections 5(n) and 8(d) of the Federal Water Pollution Control Act. The Section 8(d) amendments of this bill would extend the authority for the Federal construction grant program from the present level of $1.65 billion to $2.0 billion for the fiscal year ending June 30, 1972. The language of the bill declares that of this amount "not to exceed $167 million may be allocated for the fiscal year ending June 30, 1972, to assist in the construction of projects utilizing advanced treatment methods for the treatment of wastes on a regional scale for areas with especially severe water pollution control problems."

The committee report accompanying the bill (Report No. 92-777) discussed in some detail the need for discretionary flexibility in the construction grant program, particularly with regard to the Blue Plains project. The $62 million for Blue Plains was specifically mentioned and headed a list of six municipalities with critical problems for which additional funds were needed.

Efforts are now underway to have the House Public Works Committee consider S.3572 as soon as possible. Such action would release funds now needed at Blue Plains.

[2]Described Further in Blue Plains Interim Treatment Program
[3]The contract status, total project cost, eligible grant cost under existing conditions of Federal financing, and allocations of costs to Maryland, District of Columbia, and Virginia are shown in Appendix B.

If the present conditions of Federal financing prevail in fiscal year 1973, then approximately $73 million will be needed for FY 1973 to finance the Federal grant portion of the Blue Plains project.

The funds now available to the District will allow construction of secondary treatment facilities only, and contracts for such work have been scheduled.

Contracts for the advanced waste treatment facilities of the Blue Plains plant were previously scheduled to be let about July 1, 1972. From the time funds are available to the time of advertising for bids, many important details are worked out and this period of time must be at least three months. As previously stated, delays in the final project completion date can roughly be measured from April 1, 1972, until the date that funds are available.

II. Blue Plains Interim Treatment Program

The present pollutant load as measured by BOD_5 to the Potomac River from the Blue Plains sewage treatment facility varies from 95,000 to 153,000 pounds per day on the basis of monthly average flow figures. At the time of drafting the Memorandum of Understanding, it was anticipated that the average BOD loading to the river would not exceed 100,000 pounds per day. This understanding was stated in a conditional statement appended to the Memorandum by the Commonwealth of Virginia.

Recognizing that the agreed upon average BOD loading was being exceeded the District of Columbia, Fairfax County, and the WSSC entered into an agreement to provide interim treatment to reduce the pollutional load to at least 100,000 pounds per day pending completion of the expanded and upgraded facilities at Blue Plains. The estimated cost for the interim treatment program is approximately $5 million annually.

The interim treatment will involve the use of chemical additives to supplement the present biological treatment process and therefore improve the treatment plants' ability to remove pollutants from sewage before the treated effluent is discharged into the river. The interim treatment program should also have the additional side benefit of removing over half of the phosphorus since the chemical additives to be used will not only improve removal of the BOD_5 pollutant but also help remove the phosphorus pollutants. The additional sludge generated by the interim treatment program is to be removed and disposed of by the State of Maryland.

Progress has been made by the District of Columbia in preparing for the start-up of the interim treatment. The necessary equipment and chemicals have been obtained and required piping changes made.

The District of Columbia personnel have stated that they will commence interim treatment of Blue Plains wastes on June 1, 1972. Initially, a dosing rate of 15 mg/l will be used to precipitate suspended solids. The application rate will be increased in increments of 15 mg/l per month until the dosing rate of 60 mg/l is reached. Careful records will be kept in order to determine the final application rate to be used. It will take about six months to work out anticipated problems of interim treatment and sludge handling at Blue Plains.

The estimated sludge production with the addition of 60 mg/l to an average daily flow of 275 mgd (or 11 tons per day of alum applied) is about 900 tons per day of sludge (filter cake).

The District of Columbia personnel are prepared to dispose of the sludge until July 10, 1972, at which time Maryland will be ready to take the sludge from Blue Plains.

The Maryland Environmental Service has made a commitment to receive, transport, and dispose of the sludges generated at Blue Plains during the next few years.

On Monday, July 10, 1972, Maryland personnel stated that they will be prepared to take sludge from Blue Plains and dispose of it on State-owned land near Cheltenham. The delay from the target date of May 15, 1972, is due to site preparations including road construction and clearing. Hauling will be done in Dempsey Dumpster-type trucks.

Before the end of the two-year period, Maryland and the District hope to develop a contract for the long term handling of sludges from the Blue Plains plant. While the District will have incineration facilities available before the end of the period, it will have no other options for disposal on District land. A study on the effects of land disposal of both raw and digested sludge is being undertaken by the State of Maryland in conjunction with the U. S. Department of Agriculture at the Agricultural Research Center in Beltsville, Maryland. The study may show an effective reuse of these waste materials.

The agreement on interim treatment also provided that the District of Columbia would move expeditiously to complete the Upper Potomac Interceptor Relief Sewer, thereby eliminating permanently sewage overflows in the Georgetown waterfront area. A contract has been awarded for this work and the "gap" should be closed by temporary means by July 31, 1972, and be permanently closed by the end of 1973. The work in the Lincoln Memorial area has been completed and the Potomac River pumping station placed in operation. This work has eliminated the major overflows in the area and should prevent further problems with overflows as long as the flow remains substantially what it has been during the past year. Overflows of approximately 1-2 mgd magnitude will require a temporary pumping station and pipeline of approximately 2 MGD capacity, from about 36th St., N. W. to 30th St., N. W., until the Upper Potomac Interceptor Relief Sewer is completed. This temporary pumping station and pipeline will be constructed by the contractor for the permanent work and should be in operation by early fall of 1972.

III. Requirements for and Scheduling of Wastewater Treatment Facilities in the Conference Area (Except Blue Plains)

The Potomac River Enforcement Conference of April/May 1969 established levels of treatment and implementation schedules for the upgrading and expansion of treatment facilities as follows:

Based on the existing points of discharge, waste treatment facilities now discharging to the Potomac River between river mile 106 and river mile 91 shall be improved to achieve removal of BOD_5, total phosphorus, and total nitrogen so as to limit loadings as follows:

Facility	lbs/day		
	BOD_5	Total P	Total N
Pentagon	300	20	145
Arlington	1,300	60	650
District of Columbia	12,700	560	6,130
Alexandria	1,300	60	630
Fairfax Westgate	900	40	445
	16,500	740	8,000

Additional loading and additional points of discharge will be acceptable only if the resultant water quality will be equal to, or better than, that which would result from adherence to the above load limits at the existing points of discharge. Flow augmentation from upstream reservoirs could alter the above load allocations.

Construction schedules for the foregoing plants are as follows:
District of Columbia Blue Plains:

Treatment Process	Start Design	Ready for Bid	Start Construction	Finish Construction
Primary & Excess Flow	5/1/69	3/1/70	7/1/70	7/1/72
Secondary (90% BOD removal)	12/1/69	12/1/70	4/1/71	4/1/74
Tertiary	12/1/69	7/1/71	11/1/71	Dec. 1974

Facility	Preliminary Completed	Final Plans	Commence Construction	Operational
Pentagon STP	4/1/70	4/1/71	8/1/71	8/1/73
Arlington, Va.	3/1/70	3/1/71	7/1/71	7/1/73
Alexandria, Va.	3/1/70	3/1/71	7/1/71	7/1/73
Fairfax Westgate	3/1/70	3/1/71	7/1/71	7/1/73

The treatment plants listed below shall provide 96 percent BOD_5 removal, 96 percent phosphorus removal, and 85 percent total nitrogen removal, so long as they discharge their effluents to tributaries or embayments of the Potomac River.

Construction schedules are as follows:

Facility	Preliminary Completed	Final Plans	Commence Construction	Operational
Charles Co., Md. Mattawoman Creek	3/1/70	3/1/71	7/1/71	7/1/73
Fairfax County Dogue Creek	1/1/70	10/1/70	2/1/71	8/1/72
Little Hunting Creek	1/1/70	10/1/70	2/1/71	8/1/72
Accotink-Pohick	3/1/70	3/1/71	7/1/71	7/1/73
Andrews AFB*				
STP #1	3/1/70	3/1/71	7/1/71	7/1/73
STP #4	3/1/70	3/1/71	7/1/71	1/1/73
Piscataway	3/1/70	3/1/71	7/1/71	1/1/73
Fort Belvoir				
STP #1	3/1/70	3/1/71	7/1/71	1/1/73
STP #2	4/1/70	4/1/71	8/1/71	8/1/73
Naval Comm.Sta.*	1/1/70	10/1/70	2/1/71	3/1/72

*These installations should, as an alternative, explore the possibility of connecting to other sewage systems serving their area.

VIRGINIA

Since 1969 several decisions have been made concerning further regionalization.

a. Arlington County has reached agreement with the General Services Administration whereby the Pentagon treatment facility will be abandoned and its waste discharged to the Arlington County treatment facility.

b. Fairfax County will abandon its Westgate, Little Hunting and Dogue Creek plants. The wasteflow now received at Westgate will be distributed between the City of Alexandria and Lower Potomac plants. Sewage now discharged to the Little Hunting Creek and Dogue Creek plants will be discharged to the Lower Potomac plant.

c. The Ft. Belvoir plants will be abandoned and the sewage from this installation will be discharged to the Lower Potomac plant. None of these decisions affect the requirements established by the Enforcement Conference.

The interim dates in the approved implementation schedules have not been met and slippage of from six months to a year has occurred.

The Administrator, concerned with the slippage that had occurred in meeting the interim dates established for the construction of these three vital treatment plants in Northern Virginia, addressed a letter to the Governor asking how the Commonwealth of Virginia proposed to meet the completion date for these facilities of July 1, 1973.

The Governor responded by letter of April 10, 1972, to the effect that the schedule could not be met but that all three facilities would be completed to coincide with the completion date established for the Blue Plains facility. It was further indicated that if it appeared that the completion dates would not be met that special orders would be issued and appropriate legal remedies sought to insure that construction will be completed by the deadline. Revised construction schedules were submitted by Virginia as follows:

ALEXANDRIA SANITATION AUTHORITY

	Treatment Units	Design Complete	Review, Revision Funding, Bidding and Awards	Construction
1st Phase	Preliminary Treatment Units	December 1971	April 1972	April 1972 to July 1973

	Treatment Units	Design Complete	Review, Revision Funding, Bidding and Awards	Construct.
2nd Phase	Advanced Waste Treatment Units	April 1972	July 1, 1972	July 1, 72 to Jan. 1, 74
3rd Phase	Sludge Disposal	October 1, 1972	January 1, 73	Jan. 1, 73 to Jan. 1, 74
4th Phase	Miscellaneous	October 1, 1973	January 1, 73	Jan. 1, 73 to Jan. 1, 74

FAIRFAX COUNTY - LOWER POTOMAC PLANT

Project	Complete Design	Begin Construction	Complete Construct.
Lower Potomac Plant Expansion	December 14, 1971 (plans now approved)	May 1, 1972	May 1, 1974
36 MGD AWT Addition Lower Potomac Plant	March 31, 1972	August 1, 1972	August 1, 1974
Little Hunting/Dogue Accotink Pumpover	March 31, 1972	August 1, 1972	Summer 1974
Westgate Pumpover	March 31, 1972	Fall 1972	Summer 1974

Revised plans for expansion received February 15, 1971

ARLINGTON COUNTY

Scope of Contract	Final Plans	Begin Construction	Complete Construct.
Enlargement of Secondary treatment	March 1, 1972	June 1, 1972	January 1, 1975
Advanced Waste Treatment (excluding nitrogen removal)	April 1, 1972	July 1, 1972	January 1, 1975
Sludge Handling and Control building	May 1, 1972	August 1, 1972	January 1, 1975

MARYLAND - Piscataway

The wastewater treatment facility on Piscataway Bay in Prince Georges County, Maryland, was designed and constructed during the 1960's to

provide needed treatment capacity for an increasing population growth primarily in the southern part of that County. The Washington Suburban Sanitary Commission is the owner and operator of that facility. Almost since the time of its inception, the Piscataway plant has been the center of controversy, charge and countercharge, and there has been a continuing chain of troublesome problems and issues. The plant was placed in operation in the fall of 1967 and was almost immediately beset with problems of operational startup and then later with overloading. The initial plant was designed for a capacity of 5 mgd. Due to the problems of overloading, the Maryland State Health Department in late 1969 directed that the plant be expanded to a capacity of 30 mgd.

The Potomac River Enforcement Conference, reconvened in 1969, considered water quality problems in Piscataway Bay as part of its deliberations on Potomac River estuary problems. As part of the total program to improve water quality in the Estuary, the Conference recommendations included treatment plant requirements and a schedule for implementation of those requirements. The requirements were based upon technical studies which were being undertaken at that time by EPA's predecessor agency. The requirements for discharges to embayments in Zone II of the Estuary (Zone II is the second 15 mile segment of the Estuary measured downstream beginning at Chain Bridge) were established as percentage removals for plant discharges because the modeling aspects of the technical study were not at that time refined sufficiently to permit the establishment of pound loading restrictions in Zone II. The recommendations adopted at the April/May 1969 session of the Conference set the following treatment level requirements for the Piscataway facility and its discharge to Piscataway embayment: 96% BOD removal, 96% phosphorus removal, and 85% nitrogen removal. Treatment facilities, including primary, secondary and AWT, at Piscataway to meet these requirements were to be provided according to the following schedule adopted by the Conference:

Preliminary plans completed	- March 1, 1970
Final Plans	- March 1, 1971
Commence construction	- July 1, 1971
Operational	- January 1, 1973

The EPA study on the embayment has continued since 1969, and further refinements have allowed the determination of actual load limits in pounds per day which would be required for a discharge to Piscataway Bay. These limits are documented in Technical Report 35 of EPA's Chesapeake Technical Support Laboratory, dated April 1971. The actual

allowable limits are variable with the volume of discharge from the plant, since flow variations alter the transport mechanism in the Bay. The referenced report includes load limits for discharge flows of 24, 49, and 79 mgd. Additional model runs have recently been made to produce similar data for flows of 6-7, 15, and 30 mgd, which are recognized milestones in the expected expansion of flows at Piscataway. These data are included as Appendix C.

The original Piscataway facility is now undergoing expansion to 30 mgd in accordance with the directive of the Maryland State Health Department. The secondary facilities and polishing lagoons of this expansion are essentially complete and the primary and sludge handling facilities are about 25% complete. Based on the facilities now available, the Maryland Department of Health and Metal Hygiene recently approved the increase of treatment capacity of Piscataway to a level of 15 mgd. Federal grant offers for assistance in the construction of these facilities have been made; however, the grants were conditioned on WSSC's meeting the degree of treatment and implementation schedule established by the Enforcement Conference as outlined above. Because of the failure of WSSC to meet those requirements, no grant payments have been made for construction of secondary facilities at Piscataway.

In 1966, a proposal was developed to design and construct an advanced waste treatment (AWT) pilot in conjunction with the Piscataway treatment facility. This experimental facility would investigate certain techniques for high-level removals of phosphorus, BOD and solids at a treatment capacity of 5 mgd. Nitrogen removal is not included as part of this pilot operation. As a pilot plant, this facility was not designed or intended to be used as a part of the total plant operation to provide dependable, day-to-day, continuous AWT treatment at Piscataway. It was expected that most of the pilot facilities would be later converted to become an integral part of the total AWT facility at Piscataway. The construction of this pilot facility, supported in large part by EPA research and construction grant funds, is expected to be complete within the next few months.

A 180-day notice was issued against the WSSC on February 24, 1972, for failure to meet water quality standards in the Potomac River and Piscataway Bay because of its discharge to the Blue Plains sewage treatment facility and its discharge from the Piscataway sewage treatment facility. The EPA contends that low dissolved oxygen and algae growth in Piscataway Bay have resulted from the failure of the WSSC to provide AWT at Piscataway in accordance with the requirements of the Enforcement Conference.

The WSSC has reported that advanced waste treatment facilities are under design and that plans and specifications will be submitted to

the State for review in the near future. The approved scheduled date, March 1, 1971, for completion of plans and specifications has passed and EPA has not to date (5/23/72) been advised of a revised firm date.

FEDERAL INSTALLATIONS

Pentagon, Arlington County, Virginia

The General Services Administration entered into an agreement with Arlington County whereby the County will treat the Pentagon waste at the Arlington plant. This solution will eliminate the Pentagon wastewater treatment plant that presently discharges disinfected secondary effluent to the Boundary Channel.

A consulting engineer has been selected by the General Services Administration to design its portion of the project. The projected construction completion date is 3 months ahead of the operational date originally projected by the conferees. The schedule for this revised project is as follows:

Schedule		Present Status
Selection of A/E	September 1, 1971	Complete
Consummation of Agreement w/county	October 20, 1971	Complete
Completion of design	May 1, 1972	Complete
Advertise for bids	June 1, 1972	Complete
Contract award	July 1, 1972	
Construction completion	April 1, 1973	

Fort Belvoir, Fairfax County, Virginia

Project funds have been obtained and preliminary plans are complete. The preliminary plans call for a regional solution that will eliminate the two Fort Belvoir plants and transport wastes to the Lower Potomac treatment plant. The schedule and present status of this project are as follows:

Schedule		Present Status
Preliminary plans	July 1, 1970	Complete
Final plans	August 1, 1971	Complete
Contract award	September 1, 1972	
Completion construction	December 1, 1973	

The completion date for eliminating the two Fort Belvoir plants must coincide with the companion Fairfax County, Little Hunting/Dogue Creek pumpover project. The Corps of Engineers has advised that the schedule can be adjusted to meet changes in the county time frame. Since the Little Hunting/Dogue Creek project is not scheduled for completion until the summer of 1974, the elimination of the Belvoir plants will be approximately one year behind the original operational date proposed by the conferees.

Agricultural Research Center, Prince Georges County, Maryland

The Agricultural Research Center has programmed funds in the FY 73 budget request to meet the standards set by the conferees. The schedule and current status of this project are as follows:

Schedule		Present Status
Completion of preliminary plans	August 1, 1971	Complete
Completion of final plans	July 1, 1972	
Commence construction	September 1, 1972	
Completion of construction	July 1, 1974	

Naval Ordnance Laboratory, Silver Spring, Maryland

The Navy's proposal for this installation is to eliminate the existing wastewater treatment facility and connect to the WSSC system with treatment at the D. C. plant. The existing plant discharges disinfected secondary effluent to Paint Branch, a tributary of the Anacostia River. Funds for this project are available. The projected completion date is approximately nine months behind the original operational date set by the conferees but connection of the facility is scheduled to coincide with completion of secondary facilities at the D. C. plant. This is necessary so that the equivalent treatment presently being provided will be assured. The schedule and present status of this project are as follows:

Schedule		Present Status
Preliminary plans	March 1, 1970	Complete
Agreement w/WSSC	July 1, 1971	Tentative agreement made
Final plans	October 15, 1972	
Commence construction	April 1, 1973	
Complete construction	April 1, 1974	

Naval Communications Station, Cheltenham, Maryland

The Navy has received funds for meeting the conference recommendations. The plan is to eliminate the existing secondary plant and connect to the WSSC system with treatment at the Piscataway wastewater treatment plant. The schedule and present status are as follows:

Schedule		Present Status
Obtain funds	FY 71	Complete
Preliminary plans	January 1, 1970	Complete
Final plans	July 1, 1971	Complete
Commence construction	June 1, 1972	
Complete construction	December 1, 1972	

Andrews Air Force Base, Maryland

The Air Force proposal to eliminate the three existing secondary wastewater treatment plants and connect to the regional system of WSSC has bogged down in the negotiation process. WSSC and Andrews are now in agreement with the monetary consideration and major contract elements. Prince Georges County, however, has not approved a required change in WSSC planning to accommodate this project. The negotiation process has caused the project to fall approximately seven months behind schedule. However, Air Force personnel feel that the seven months can be cut from the original time allowed for construction and that the original construction completion date can be met if Prince Georges County approves a change in the plan. The schedule and present status are as follows:

Schedule		Present Status
Preliminary plans	March 1, 1970	Complete
Agreement w/WSSC	November 1, 1971	Basic agreement with WSSC--no contract
Selection of A/E	December 1, 1971	
Final plans	April 1, 1972	
Contract award	May 15, 1972	
Complete construction	May 1, 1973	

FEDERAL WASTEWATER TREATMENT FACILITIES IN THE METROPOLITAN D.C. ENFORCEMENT CONFERENCE AREA

Name of Installation	Present Treatment	Needs	Proposal	Projec FY Fundi
Andrews AFB, Maryland	Secondary (3 plants)	Advanced waste treatment or regional connection	Connection to WSSC's Piscataway STP	'71
Naval Communication Station, Cheltenham, Maryland	Secondary	Advanced waste treatment or regional connection	Connection to WSSC's Piscataway STP	'72
Naval Ordnance Lab White Oak, Maryland	Secondary	Advanced waste treatment or regional connection	Connection to WSSC's D.C. STP	'72
Agricultural Research Center, Beltsville, Maryland	Secondary	Advanced waste treatment or regional connection	---	'73
Fort Belvoir, Virginia	Secondary (2 plants)	Advanced waste treatment or regional connection	Connection to Fairfax County's Accotink Pohick STP	'71
Pentagon, Virginia	Secondary	Advanced waste treatment or regional connection	Connection to Arlington County system	'71

IV. Evaluation of Wastewater Treatment Plants in the Conference Area (Except Blue Plains)

During the week of May 15 through 19, 1972, Messrs. A. West, T. Jaffe, and C. Bardonner of EPA's technical staff visited 16 waste treatment plants discharging to the lower Potomac River or its tributaries. The plants were:

a. Federal facilities - Pentagon; Andrews AFB (2 plants); Naval Communications Sta., Cheltenham, Md.; Naval Ordinance, Silver Spring, Md.; Dept. of Agriculture, Beltsville, Md. (2 plants); Fort Belvoir, Va. (2 plants).

b. Non-Federal - Piscataway, Md.; Arlington, Alexandria, Westgate, Dogue Creek, Little Hunting Creek, Lower Potomac - all in the State of Virginia.

Each plant was visited by one of the staff to observe and evaluate plant operation and performance, and to obtain laboratory and operational data.

On the basis of the laboratory and operational data furnished, an evaluation as to compliance with the conferees' recommendations at the 3rd session of the Potomac River Enforcement Conference, 1969 has been made and summarized in Table 1 attached for 15 months from January 1971 through March 1972. The table reflects the conference recommendation treatment levels and the actual operating performance over the last fifteen months. It should be recognized that achievements of the conference recommendation have been scheduled for 1973.

TABLE I

A. Waste Treatment Plants, Recommendations in Pounds/Day

PLANT	CONFERENCE RECOMMENDATION	PRESENT AVERAGE VALUE
Pentagon	BOD_5 - 300 lbs./day	199 lbs./day
	Total P - 20 lbs./day	No data
	Total N - 145 lbs./day	No data
Arlington, Va.	BOD_5 - 1300 lbs./day	3703 lbs./day
	Total P - 60 lbs./day	1382 lbs./day
	Total N - 650 lbs./day	No data
Alexandria, Va.	BOD_5 - 1300 lbs./day	8291 lbs./day
	Total P - 60 lbs./day	1786 lbs./day
	Total N - 630 lbs./day	4617 lbs./day
Westgate, Va.	BOD_5 - 900 lbs./day	3551 lbs./day
	Total P - 40 lbs./day	285 lbs./day
	Total N - 445 lbs./day	No data

TABLE I (Continued)

B. Waste Treatment Plants Recommendations in Percent Removal

PLANT	CONFERENCE RECOMMENDATION	PRESENT AVERAGE VALUE
Dogue Creek, Va.	96% BOD_5 Removal	87.8%
	96% Total P Removal	78.1%
	85% Total N Removal	No data
Little Hunting Creek, Va.	96% BOD_5 Removal	87.6%
	96% Total P Removal	80.7%
	85% Total N Removal	No data
Lower Potomac, Va.	96% BOD_5 Removal	87.2%
	96% Total P Removal	25.2%
	85% Total N Removal	32.7%
Piscataway, Md.	96% BOD_5 Removal	95.0%
	96% Total P Removal	57.5%
	85% Total N Removal	14.4%
Andrews AFB, Md. a. Plant No. 1	96% BOD_5 Removal	87.5%
	96% Total P Removal	No data
	85% Total N Removal	No data
b. Plant No. 4	96% BOD_5 Removal	85.8%
	96% Total P Removal	No data
	85% Total N Removal	No data
Naval Communications Sta., Md.	96% BOD_5 Removal	97.0%
	96% Total P Removal	No data
	85% Total N Removal	No data

TABLE I (Continued)

PLANT	CONFERENCE RECOMMENDATION	PRESENT AVERAGE VALUE
Naval Ordinance, Md.	96% BOD_5 Removal	91.3%
	96% Total P Removal	No data
	85% Total N Removal	No data
D.A., Beltsville, Md.		
a. Bldg. 218	96% BOD_5 Removal	83.2%
	96% Total P Removal	No data
	85% Total N Removal	20%
b. Plant Industry Sta.	96% BOD_5 Removal	81.5%
	96% Total P Removal	50%
	85% Total N Removal	50%
Fort Belvoir, Va.		
a. Plant No. 1	96% BOD_5 Removal	85.4%
	96% Total P Removal	No data
	85% Total N Removal	No data
b. Plant No. 2	96% BOD_5 Removal	85.2%
	96% Total P Removal	No data
	85% Total N Removal	No data

V. Provision for Additional Facilities and Selection of Sites in the Conference Area

At the time the Memorandum of Understanding was drawn (October 1970) it was recognized by all parties that the proposed expansion of the Blue Plains treatment facility would not be adequate to treat all future flows from the areas then served. It was pointed out that all jurisdictions must immediately plan to provide adequate treatment for flows in excess of those that could be accepted in the Blue Plains regional treatment facility.

The parties to the agreement made an initial allocation of the capacity of the Blue Plains treatment facility among themselves. It was recognized that within a few years of completion of the expanded Blue Plains facility some of the jurisdictions, particularly the WSSC, would need additional capacity. The WSSC had foreseen this eventuality and had already engaged a consultant, and had prepared a schedule for selection of a site for an additional regional treatment facility. It was decided by the parties concerned that the WSSC would therefore be responsible for constructing an additional regional plant or plants and that the signatory parties would be entitled to purchase capacity in this plant or plants on the same basis as capacity was paid for in the Blue Plains facility. A schedule for construction of the facility, with intermediate check points, was agreed upon.

The proposed schedule for the regional plant as described in the October 1970 Memorandum of Understanding follows:

Preliminary report completed	February 1971
Site selection	March 1971
Participants capacities allocated	June 1971
Preliminary plans completed	June 1972
Site purchase completed	March 1973
Final plans completed	January 1974
Start construction	September 1974
Complete construction	June 1977

The WSSC has not met several intermediate checkpoints, particularly site selection, and serious slippage has occurred in the planning for the construction of the facility. This in part was caused by the fact that Montgomery and Prince Georges Counties must approve the WSSC plans and they have failed to act. Recently, Maryland law has been changed to give Montgomery County responsibility for its own planning although the WSSC retains the responsibility of constructing and operating the treatment facility. As a result, Montgomery County is working towards selection of a site for a treatment facility but latest reports indicate that the final site selection will not take effect until November 1972, twenty months later than previously scheduled. It is also reported that the Piscataway treatment facility will be further expanded to serve Prince Georges County drainage within the Conference area as well as that part of Montgomery County that lies within the Anacostia drainage area.

Montgomery County has narrowed the search for a proper site from seventeen 1/ to four sites in western Montgomery County. Recognizing the need to meet the June 1977 date for completion of construction of the Montgomery County Regional wastewater treatment facility, there will be concurrent planning and design. Montgomery County personnel are in the process of employing an engineer to design a wastewater treatment facility which will use advanced waste treatment methods. By 1992 the average flow to be treated within Montgomery County would be approximately 137 million gallons per day. 2/

The Washington Suburban Sanitary Commission's Piscataway plant has a present capacity of 15 mgd and it is currently being expanded to a capacity of 30 mgd, with full secondary and AWT to be completed by 1975.

1/ Preliminary Site Selection--Report of the County Executive's Site Selecting Task Force dated May 1972

2/ Preliminary Site Selection--Report of the County Executive's Site Selecting Task Force, May 1972

VI. Piscataway - National Park Service Easement

When the Piscataway wastewater treatment facility is completed, with advanced waste treatment units in place, the treated effluent must be discharged to the Potomac River rather than to the Piscataway embayment. It is pointed out that the residual nutrient loads even after the high degree of treatment provided by the AWT Units, will degrade the quality of water of the embayment below water quality standards and offensive eutrophication will result from these discharges.

Therefore arrangements should be made to discharge the effluent directly to the Potomac River, either by a pipeline on an easement across the National Park Service property or by pipeline laid in a trench along the bottom of the embayment to the Potomac River. The second route mentioned would probably be very expensive. An application for a permit to construct a pipeline across National Park Service property has been filed with the Park Service.

VII. Allocation of Waste Loads to the Several Regional Facilities (To Assure No Overloading of Blue Plains)

The October 1970 Memorandum of Understanding described the rationale for limitation of Blue Plains to 309 million gallons per day and allocated waste loads to the District of Columbia, Virginia, and the Washington Suburban Sanitary Commission. Specific reference is made to the introductory paragraph, and to the numbered paragraphs 2, 5, 7, and 8.

In view of the rapidly growing Washington Metropolitan area, the question must be raised as to whether the proposed 1977 date for completion of the first regional wastewater treatment plant in the WSSC service area is early enough. Studies were made of projected populations and waste loads generated therefrom. The estimated loads indicate that waste loads to the Blue Plains facility averaging 309 mgd will be generated during calendar year 1976.1/ The factors used were conservative. Therefore, alternative plans should be developed to relieve the overload anticipated, commencing January 1, 1976. If a large regional plant is to be the alternative selected, such a facility should be operational by July 1975.2/

It is reported that wastewater flows into the Blue Plains facility are accurately measured. It is understood that tributary wastewater flows from the several jurisdictions consist of a combination of measured flows and estimated flows.

The difficulty of accurately measuring sources of flows is understood as there may be more than 17 primary points of measurements and about 80 other secondary points to measure flows. Instruments to accurately measure flows are not sufficiently sophisticated.

The accuracy of volumes of flows to the Blue Plains facility from the several contributing jurisdictions may be questioned until such flows are accurately measured. In addition, such measurements could be used in connection with the combined sewer problem and the infiltration problem.

1/ See Table I and Table II. Table I is a District of Columbia Department of Environmental Services report on flows to the Blue Plains Plant and Table II shows the wastewater flows as projected by EPA.

2/ All affected parties are not in agreement that the Blue Plains capacity will be used up by January 1976.

DEPARTMENT OF ENVIRONMENTAL SERVICES
Bureau of System Planning

ESTIMATED MONTHLY AVERAGE FLOWS IN M.G.D. FROM JURISDICTIONS SERVED BY THE WATER POLLUTION CONTROL PLANT, BLUE PLAINS, WASHINGTON, D.C.

Date	W.S.S.C.	Fairfax	Pot. Int.	D.C.	Total Flow	Georgetown Spillage*	Flow to W.P.C.P.
Fiscal 1971	119.36	5.90	5.47	134.73	265.46	- (6.07) =	259.39
December 1971	123.63	6.33	6.80	138.50	275.26	- (3.32) =	271.94
January 1972	128.41	6.22	6.80	130.69	272.12	- (2.64) =	269.48
February 1972	145.54	6.80	7.19	132.56	292.09	- (5.20) =	286.89
March 1972	142.53	5.84	7.25	126.79	282.79	- (12.83) =	269.58
April 1972	143.74	6.70	7.30	133.90	291.64	- (13.37) =	278.27
May 1972							
June 1972							

*Included in total flow.

3/2/72

TABLE I

TABLE II

PROJECTED WASTEWATER LOADS OF AREAS
PRESENTLY TRIBUTARY TO BLUE PLAINS FACILITY

YEAR [1]	TOTAL FLOW TO BLUE PLAINS (MGD)	W.S.S.C. TO BLUE PLAINS (MGD)	POTOMAC INTER-CEPTOR (MGD)	PIMMIT RUN (MGD)	D. C. (MGD)
1971	265.5	119.4	5.5	5.9	134.7
1972	273.9	124.6	8.0	6.0	135.3
1973	282.3	129.8	10.5	6.1	135.9
1974	290.7	135.0	13.0	6.2	136.5
1975	299.1	140.2	15.5	6.3	137.1
1976	307.6	145.5	18.0	6.4	137.7
-- 309.0 MGD HYDRAULIC LOAD LIMIT SET ON BLUE PLAINS --					
1977 [2]	315.5	150.7	20.0	6.5	138.3
1978 [2]	323.4	155.9	22.0	6.6	138.9
1979 [2]	331.3	161.1	24.0	6.7	139.5
1980 [2]	339.4	166.6	26.0	6.8	140.0
1990 [2]	420.0	216.0	46.0	8	150.0
2000 [2]	498.0	265.0	65.0	8	160.0

1/ Beginning of calendar year.

2/ 309 MGD limit exceeded.

VIII. The Need for a Washington Metropolitan Regional Plan

The solution to water quality management problems in the Washington Metropolitan Area involves all the governing bodies in the area. Maryland, Virginia, and the District of Columbia as well as the local governing bodies all have a role to play in developing regional solutions. The State agencies as well as local jurisdictions must be committed to the development of a coordinated planning process which meaningfully addresses the water quality management problems of the entire Washington Metropolitan Area. A great amount of effort has already been expended in developing planning information in this area. The Potomac River Enforcement Conference, the Memorandum of Agreement of October 1970, the Interim Treatment Agreement of October 18, 1971, the work of the Council of Governments, the Northern Virginia Planning Commission, the Maryland Department of State Planning, the Maryland-National Capital Park and Planning Commission, and others are valuable sources of data and information. However, there remains a major need to tie these efforts together in a coordinated Regional Plan for the entire Washington Metropolitan Area.

The present situation in Montgomery County concerning planning and construction of a regional wastewater treatment plant is a good illustration of the need for an overall Regional Plan. There is an urgency for Montgomery County and WSSC to expend millions of dollars in a relatively short time. The Montgomery County planning is of necessity being done in a void as to the framework of an overall Regional Plan. Decisions made by Montgomery County are certain to impact others in the Washington Metropolitan Area.

Therefore, an overall Regional Plan and institutional arrangements concerning a legal commitment to cooperate at all levels of government are absolute necessities to solve the water quality management problems in the Washington Metropolitan Area in an orderly and logical manner. There must be an understanding of such a need at the highest levels of governments involved.

IX. Combined Sewers and Storm Wastes

The District of Columbia has been aware of the combined sewer overflow problem for many years and has had an active program to correct the problem. In 1932 the first work to separate combined sewers into sanitary and storm sewers was undertaken in the vicinity of MacArthur Blvd. and Arizona Avenue, N. W. Work continued in this and four other areas until the shortage of material and manpower occasioned by the war forced its deferment in 1942.

Following the war the District obtained the services of a Board of Engineers. In 1957 the Board outlined alternate plans for abating or eliminating pollution resulting from existing sewer systems. Project C, which was selected included a program for the continuation of the sewer separation program and in 1960 this work was resumed. The work continued at a level of about one million dollars per year until 1969 at which time the Federal enforcement conference established the requirement of advanced waste treatment for the District of Columbia. In the late sixties a number of studies were performed by the Federal Water Pollution Control Administration and others showing that storm water from an urban area itself contained considerable pollution.

During the course of the development of the program to comply with the requirements of the enforcement conference serious questions were raised about the feasibility of continuing the sewer separation program in view of the growing evidence that the discharge of storm water itself into an estuary such as the Potomac in the vicinity of Washington could under certain circumstances reduce the benefits of advanced waste treatment. A number of studies were performed principally by the Federal Water Pollution Control Administration, using the Washington situation as a case study. As a result of these studies and various other research, a tentative decision was made to investigate a program based upon the capture of combined and storm sewer discharges in a deep tunnel system and the treatment of such flows at the District of Columbia's Blue Plains Water Pollution Control Plant during off peak periods. Very rough estimates indicate that the cost of a tunnel system would be about $500 million.

In view of the high cost of several major projects under consideration and severe budget constraints, it was necessary to set priorities.

Primary emphasis has been placed on financing and construction of the advanced wastewater treatment facility at Blue Plains. With the local share of funding committed for this first priority project, the Department of Environmental Services (formerly the Department of Sanitary Engineering) requested $400,000 in its FY 1972 budget to conduct initial studies and preliminary design of a system of storm and combined sewer overflow containment and/or treatment. A proposal was discussed with the Environmental Protection Administration and prospects of federal matching grants appeared encouraging. However, the requested funds were deleted from the budget in favor of other more urgent District matters.

It is the intention of the Department of Environmental Services to renew its efforts to begin the planning of this project prior to the completion of the Blue Plains facility so that an immediate effort can be made on the second phase of this water resource management problem in the District of Columbia at the earliest possible date.

The City of Alexandria, Virginia, has reviewed the report by consultants Greeley and Hansen entitled, "Study of Water Pollution from Combined Sewer Overflows." It is understood that the City of Alexandria has budgeted funds for capital expenditures in this problem area.

The problems related to treatment of wastewaters and scheduling of construction of wastewater treatment plants are advancing toward resolution. It is time for the conferees to begin planning on an overall regional basis for the control and treatment of pollution related to combined sewers and storm waters.

APPENDIX A

COMPARISON OF 1970 DISCHARGES AND CONFERENCE REQUIREMENTS

Treatment Facility	Population Served 1970	Treated Waste Discharge 1970		Conference Requirement 1969			Population Served 1970	Treated Waste Discharge 1970	Conference Load Limit 1969
			lbs/day	Load	Limit lbs/day	Date		lbs/day	lbs/day
Pentagon	10,600**	BOD	360	BOD	300	8/1/73			
		P	65	P	20				
		N	20	N	145				
Arlington	247,000	BOD	5,460	BOD	1,300	7/1/73			
		P	1,650	P	60				
		N	1,020	N	650				
Alexandria	190,000	BOD	13,000	BOD	1,300	7/1/73	Va. → 573,000	BOD 29,720	3,800
		P	2,300	P	60			P 5,295	180
		N	3,690	N	630			N 6,560	1,870
Fairfax-Westgate	124,400	BOD	10,900	BOD	900	7/1/73			
		P	1,280	P	40				
		N	1,830	N	445				
Blue Plains-D.C.	1,830,000	BOD	103,800	BOD	12,700	4/1/74 (90% BOD removal)			
		P	17,300	P	560	1975-77(Tertiary)			
		N	46,200	N	6,130				
							D.C. → 1,848,300	BOD 107,540	12,700
Sewer Overflows-D.C.	18,300***	BOD	3,740	BOD	Not	7/1/72 (chemical		P 17,470	560
		P	170	P	Specified	treatment)		N 46,660	6,130
		N	460	N					
Piscataway	55,000	BOD	540 (91%)*	BOD	96% (252)*	1/1/73	Md. → 55,000	BOD 540(91%)*	96%(252)*
		P	320	P	96%			P -	96%
		N	630	N	85%			N -	85%
Fairfax-Hunting Cr.	25,000	BOD	1,390 (66%)*	BOD	96% (162)*	8/1/72			
		P	380	P	96%				
		N	620	N	85%				
Fairfax-Dogue Cr.	20,000	BOD	915 (77%)*	BOD	96% (162)*	8/1/72			
		P	270	P	96%				
		N	385	N	85%				
Ft. Belvoir # 1	3,600	BOD	120 (89%)*	BOD	96% (44)*	1/1/73			
		P	30	P	96%				
		N	25	N	83%				
							Va. → 67,000	BOD 2,805(82%)*	96%(508)*
								P -	96%
								N -	85%
Ft. Belvoir # 2	18,400	BOD	380 (89%)*	BOD	96% (140)*	8/1/73			
		P	175	P	96%				
		N	430	N	85%				
Fairfax-Lower Potomac**** (Accotink-Pohick)	—	BOD	-	BOD	96% (—)	7/1/73			
		P	-	P	96%				
		N	-	N	85%				
Charles Co., Md. Mattawoman Cr.	—	BOD	-	BOD	96%	7/1/73			
		P	-	P	96%				
		N	-	N	85%				
Naval Ordnance Sta. Indian Head, Md.	6,170	BOD	232 (55%)*	BOD	Not	Not			
		P	22	P	Specified	Specified			
		N	32	N					

ZONE I — ZONE II — ZONE III — Md.

Note: Naval facilities in White Oaks and Cheltenham, Maryland, and Andrews A.F.B. in Maryland, are not included on this table because of the relatively little effect of their discharges on the Potomac River.

* Calculated percent reduction or theoretical load limit based on 1970 raw waste load
** Based on 100 gal/capita/day
*** Based on dry weather flow to wastewater facility
**** Under construction

APPENDIX B

BLUE PLAINS - CONTRACT STATUS[1]

1. Primary Facilities

   a. Total estimated cost for grant - $19,042,000
   b. Number of contracts to complete project - 3
   c. Contracts underway - 2
   d. Value of contracts underway - $16,593,000

2. Sludge Handling Facilities

   a. Total estimated cost for grant - $39,548,000
   b. Number of contracts to complete project - 5
   c. Contracts underway - 1
   d. Value of contracts underway - $2,851,000

3. Secondary Facilities

   a. Total estimated cost for grant - $44,625,000
   b. Number of contracts to complete project - 5
   c. Contracts underway - 1
   d. Value of contracts underway - $688,000

4. Excavation, Dock, Dredging, etc.

   a. Total estimated cost for grant - $46,900,000
   b. Number of contracts to complete project - 6
   c. Contracts underway - 2
   d. Value of contracts underway - $18,850,000

5. Nitrogen Removal Facilities

   a. Total estimated cost for grant - $126,541,000
   b. Number of contracts to complete project - 5
   c. Contracts underway - 0
   d. Value of contracts underway - 0

6. Mixed Media Filters

   a. Total estimated cost for grant - $47,946,000
   b. Number of contracts to complete project - 2
   c. Contracts underway - 0
   d. Value of contracts underway - 0

7. Miscellaneous Costs - $34,698,000

8. Total Project

   a. Total estimated cost for grant - $359,300,000
   b. Number of contracts to complete project - 26
   c. Contracts underway - 6
   d. Value of contracts underway - $38,982,000

[1]As of April 6, 1972

Blue Plains Financing [2]

Fiscal Year	Total Project Cost	Eligible Grant Cost	Md. Share	Federal Portion	D.C. Share	Federal Portion	Va. Share	Federal Portion
1971	$ 93,872,000	$51,630,000	$ 44,965,000	$24,731,000	$46,476,000	$25,562,000	$2,431,000	$1,337,000
1972	131,603,000	72,381,000	63,038,000	34,670,000	65,157,000	35,836,000	3,409,000	1,875,000
1973	133,825,000	73,604,000	64,102,000	35,256,000	66,256,000	36,441,000	3,466,000	1,907,000
Total	$359,300,000	$197,615,000	$172,105,000	$94,657,000	$177,889,000	$97,839,000	$9,306,000	$5,199,000

[2] As of May 1, 1972

APPENDIX C

MATHEMATICAL MODEL SIMULATIONS OF WATER QUALITY BEHAVIOR WITHIN PISCATAWAY EMBAYMENT

A. Basic Assumptions

1) Wastewater flows at the Piscataway STP were assumed to be -

   a) 7.0 MGD

   b) 15.0 MGD

   c) 30.0 MGD

2) Compliance with the allowable UOD nitrogen and phosphorus loadings developed by AFO in Technical Report Number 35 formed the basis of assumed treatment plant operating efficiencies within Zone I of the Potomac Estuary. Apportionment of loadings for individual wastewater facilities was determined in accordance with population served. Current wastewater flows at Blue Plains and elsewhere in Zone I were assumed for all model runs.

3) Model runs were based on a water temperature of 29 C and a freshwater inflow of 540 cfs. This Potomac flow was computed by deducting present water supply withdrawals at Dalecarlia (410 cfs) from the 7-consecutive-day low flow with a recurrence interval of once-in-10-years (950 cfs).

4) Current levels of UOD, nitrogen, and phosphorus in the freshwater flow were determined from regression analyses and observed data. Concentrations were assumed as follows:

   a) UOD - 5.0 mg/l

   b) N - 0.3 mg/l

   c) P - 0.1 mg/l

5) The following concentrations were assumed for each of the three Piscataway wastewater flows investigated:

UOD	N	P
10.0 mg/l	0.1 mg/l	0.02 mg/l
50.0 mg/l	0.5 mg/l	0.10 mg/l
100.0 mg/l	2.0 mg/l	0.40 mg/l
	10.0 mg/l	2.00 mg/l

B. Nutrient Criteria

In order to prevent the presence of algae at objectionable levels, certain nutrient criteria were established by AFO for the Piscataway embayment as documented in Technical Report Number 35. Specifically, recommended concentrations of N and P were 0.3 mg/l and 0.03 mg/l, respectively.

C. Water Quality Standards

Average DO concentration - 5.0 mg/l

Minimum DO concentration - 4.0 mg/l

D. Allowable Pollutant Loadings (Piscataway STP)

Utilizing the basic assumptions enumerated above and a verified mathematical model, the following allowable pollutant loadings were established for Piscataway embayment predicated on compliance with both the nutrient criteria developed by AFO and approved water quality standards:

Waste Flow (MGD)	UOD (lbs/day)	N (lbs/day)	P (lbs/day)
7.0	12,000	50	14
15.0	12,000	70	23
30.0	12,000	100	36